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ABSTRACT

An observational instrument was developed to measure social competence in kindergarten classrooms. Social competence was specified in terms of four broad behavioral categories: obedience, cooperation, interaction, and autonomy. Each category was further particularized in terms of observable behaviors. Initial 5-minute observations using the instrument were conducted in kindergarten classes; a coding sheet listing broad and specific behavioral categories was employed. Revisions of the original coding sheet included the addition of the category "aggression" and related behavioral subcategories, reduction of the time unit to 2 minutes, and provision of a way to indicate behavioral appropriateness or inappropriateness. The behavior of subjects engaged in different activities was to be observed on six occasions and coded on the new sheet. Tests of interrater reliability and a pilot study were conducted. The latter involved 52 children from three kindergarten classes in a lower-middle-class Sydney suburb. Data, collected at the beginning and end of the school year, were reduced so that scores for each subject could be computed on each competency: obedience, cooperation, positive interaction, autonomy, and negative interaction. Discrete scores were then converted to continuous dichotomies. Results indicated a statistically significant change in autonomy over the year. Statistically nonsignificant changes in the other four competencies were also evident. (The scale and guidelines for using the instrument are appended.) (RH)

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DEVELOPMENT OF AN OBSERVATIONAL SCALE TO MEASURE SOCIAL COMPETENCE IN YOUNG CHILDREN

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ABSTRACT

A live observational sign/discrete instrument utilizing time sampling was developed to measure social competence in kindergarten classrooms. Although it is desirable for measures of socio-emotional behaviour to have a strong theoretical basis, it was considered inappropriate to develop an instrument based on any one theory of development. Rather, the behaviours observed were derived from practices and approaches to curriculum followed by kindergarten teachers in New South Wales. These practices are likely to be eclectic rather than theoretically "pure". The broad categories of behaviour included in the instrument are: obedience, cooperation, interaction, autonomy, and aggression. Trials showed that the categories of behaviour and method of coding were satisfactory and it was found to have acceptable inter-rater reliability (.825). Analysis of data collected in the pilot study indicated that data could be satisfactorily reduced for use in descriptive statistics. Scores could also be converted to high/low dichotomies for inferential or correlational analyses.

Walker (1973:3) expressed the view that socio-emotional measures for young children could not be developed until adequate theories of socio-emotional development were developed. In support of this notion, Dunkin and Biddle (1974:426), from their review of the study of teaching and classroom behaviour, recommended that new observational instruments should not be developed in the absence of clear theoretical justifications.

It would seem appropriate, then, to derive a socio-emotional measure from the theoretical approach followed in the situations in which it was to be used. As the instrument was essentially for use in the early grades of elementary schools in New South Wales (N.S.W.), the theoretical approach generally followed in these classrooms was sought.

The curriculum guides followed by the majority of teachers in this state have a strong developmental base. Observations in many classrooms reveal practices not out of line with behaviourism. Many teachers in these same rooms, however, profess to humanistic ideals. Thus, it is difficult to pin-point a pure, theoretical approach. It would be fair to say that teachers in the early grades in N.S.W. follow an eclectic theoretical approach. Therefore, a socio-emotional measure for use in these classrooms should reflect such an approach.

Since the measure was to be used, ultimately, in a study concerned with success in school, teachers' opinions were canvassed to identify the social skills related to success in the early grades. These skills were identified as: obedience, cooperation, interaction and autonomy. They were grouped under the broad category of "social competence".

The Need to Develop an Instrument

Evans (1973:1), after studying measurement practices in early childhood education, concluded that innovatory measurement techniques that are both valid and reliable and practical for widespread use in the classroom, are few and far between. Walker (1973:42), though referring only to socio-emotional measures, came to the same conclusion, seeing the major problem as a mismatch between the need for socio-emotional evaluation and the existent technology.

An examination of some of the available published instruments for measuring social development (e.g. Doll, 1965; Stamp, 1968; Caldwell, 1970; Banks, 1972) found these instruments generally need to be completed by someone extremely familiar with the child; are often concerned with developmental traits and habits such as toileting, dressing, eating; are often best suited to the preschool age child; and do not measure the social competences which have been identified.

A review of the relevant literature (Wright, 1960; Boyd & de Vault, 1966; Boyer, Simon & Karafin, 1973; Walker, 1973; Dunkin & Biddle, 1974; Gordon & Jester, 1974; Coller, 1975; Katz & Jacobsen, 1978) showed that although numerous instruments have been developed for the purpose of measuring classroom behaviour, many of them specifically for early childhood settings, there is, generally, inadequate information on their reliability and validity and insufficient details of procedure and scoring for replication to be possible. More important, none measured the social competences for which a measure was sought. Thus it was necessary to develop an instrument specifically to provide a measure of social competence.

The Format of the Instrument

A clarification of terms would seem appropriate in order that confusion and/or ambiguity may be avoided. Rowley (1976:52) offers the following definitions:

> An observational instrument is a set of procedures by means of which an observer can record and categorise the behaviour of a subject or subjects.
>
> An observational record is a set of data (usually in the form of symbols) which describes one or more subjects during one or more periods of observation.
>
> An observational measure is a procedure for using an observational record to assign scores to each of the subjects of observation; each score so assigned being assumed to reflect some characteristic of the behaviour of that subject.

He added (p.53) that reliability is a property of a measure, not of an instrument or record. In the light of the aforementioned statements, it was considered necessary to develop an instrument which would produce a quick and efficient record of behaviour from which a reliable measure could be obtained.

In determining the type of instrument to be used, consideration should be given to data collection techniques. Walker (1973) outlined six ways by means of which information on socio-emotional behaviour may be collected. These are: projective measures; unobtrusive measures, e.g. school records;

self-report measures; situational measures, e.g. sociometric tests; rating scales; observational procedures. Of these, she stated that observational procedures were the most appropriate and reliable to use with young children.

Dunkin and Biddle (1974) listed three settings for observational procedures: informal, live and recorded (audio and video). In informal observation the observer performs the tasks of recording and encoding in his/her own mind (Dunkin & Biddle, 1974:58). Live observation entails an observer sitting in the classroom (or some other setting) making judgments about behaviour as it occurs (Dunkin & Biddle, 1974:60). Recordings offer the advantage of "freezing" events for subsequent study, so that the investigator has a reliable source of data which can be studied over and over again (Dunkin & Biddle, 1974:62). Since the purpose of this instrument was to produce a measure of behaviour, informal observations would have been unsatisfactory and recorded observations would have been too costly. It was decided, therefore, to utilize <u>live observations</u>.

Coller (1974:2) described several types of direct (live) observational procedures whose fundamental characteristic is their emphasis on overt behaviour. Direct observations can be made in unstructured environments (e.g. the neighbourhood), contrived situations (e.g. the laboratory) or in selected situations (e.g. the playground, classroom, nursery) (Coller, 1974:3-5). As the instrument was to be used in the classroom, it could be described as an instrument for use in <u>selected situations</u>.

Dunkin and Biddle (1974:71) distinguished between two types of instrument format, sign observation and categorical observation. Sign observation refers to the approach during which the observer lists "... beforehand a number of specific acts or incidents which may or may not occur during a

period of observation" (Medley & Mitzel, 1963:289-299). Coller (1974:11) distinguished between sign/discrete and sign/hierarchical systems.

Categorical observations require the observer to make judgments among a set of categories into which the events he/she observes are to be classified (Dunkin & Biddle, 1974:71). Coller (1974:11) added another type: field observation, whereby the observer does not have pre-set instruction to make judgments, but instead responds to field forces and describes all that occurs. For this instrument a sign/discrete system will be used as the behaviours to be observed were the pre-determined, discrete social competences.

Arrington (1943:3) defined time sampling as "... a method of sampling the behaviour of an individual or group in which the occurrence of specific, overt acts, or a classification of such acts according to predetermined definitions, is recorded in a series of time periods of uniform length in such a way as to yield quantitative measures descriptive of the characteristic frequency or variability of the behaviour for that individual or group under the conditions of behaviour".

Event sampling requires the observer to describe, check, code and/or rate only when a critical, topical or specified event occurs (Coller, 1974:14). Situation sampling refers to a sampling plan during which time is the variable and the observation takes place during a specified situation e.g. story-time, snack, outdoor activities (Coller, 1974:14).

Of these three sampling units, time sampling would appear to be the most suited to the recording of behaviour under investigation: obedience, cooperation, interaction and autonomy. Therefore the instrument would utilize this form of sampling unit.

In summary, for the purpose of measuring social competence in young children, it was decided to use a direct (live) observation procedure in a selected situation (i.e. the kindergarten classroom), utilizing a sign/discrete data system and time sampling. From the records of behaviour thus obtained, a measure can be calculated by translating the records of observation on the sign/discrete system into a dichotomous system. This is achieved by computing and recoding scores so that each subject can be rated high or low on each of the specified categories of behaviour.

Content and Administration of the Instrument

The socially competent child has been identified as one who: listens to the teacher, sits still, is attentive to instructions, carries out instructions, shares materials, asks and answers questions appropriately, is task-oriented and can work independently. Observable behaviours which typify these characteristics were identified and grouped into four broad categories as follows:

Obedience

- Responds to orders

Cooperation

- Shares materials with peers
- Shares materials with adults
- Accepts/gives help - peers
- Accepts/gives help - adults
- Takes turns

Interaction

- Asks questions
- Answers questions
- Initiates conversation
- Participates in conversation
- Initiates play
- Participates in play

Autonomy

- Works alone on teacher-directed task
- Works on self-directed task

Procedure

These categories were reproduced on a coding sheet. The observer was to sit in the classroom as unobtrusively as possible and observe the target child for a time unit of five minutes. Every time the target child displayed one of the above behaviours, a check was to be marked in the appropriate box on the coding sheet.

The instrument, in this form, was trialled in a school in a lower-middle class suburb, on two kindergarten classes. Several problems were encountered; the time unit was too long; a good deal of aggressive behaviour was observed, particularly in one classroom (there was no provision for this in the instrument); there were numerous incidents of some specified behaviours occurring at inappropriate times.

Although "aggression" cannot be strictly regarded as a 'social competence", its occurrence was so prevalent in this trailling session that, in terms of the potential usefulness of the scale being developed to measure, it seemed to classroom behaviours, warrant observation. Therefore, the following broad category, with four sub-categories was added to the original set of behaviours:

Aggression

Initiates an aggressive act - verbal
- physical

Retaliates - verbal
- physical

To provide for the incidence of inappropriate behaviour, the coding sheet was divided into two columns, one marked "Inside Rules", for appropriate behaviour to be checked and one marked "Outside Rules" for inappropriate behaviour to be checked. It was recognised that some behaviours would be unlikely to occur "Outside Rules", but this format for the coding sheet seemed to offer clarity and simplicity. (See Appendix A for a sample of the modified coding sheet.)

The original time unit of five minutes was unsatisfactory in that, very often, there would be no changes in observed behaviour in that time period. This was so in activities such as story, poetry, news and even some seat work such as tracing and colouring. Therefore, the time

unit was reduced to two minutes for each observation period and each child was to be observed on six different occasions, in different activities, making a total observation period of 12 minutes over a variety of activities. Thus a more representative sampling of each child's in-school behaviour could be obtained.

These time-intervals (two minutes) and total observation time (12 minutes) were arrived atthrough trialling the instrument. The range of intervals in previously reported instruments was too great to be helpful; Coller (1974) reported intervals of as little as six seconds in some instruments and Jones (1972) reported 15 five-minute observation periods. The former introduces the necessity of a mechanical device for timing the intervals and its associated problems, while the latter was shown above to be unsatisfactory.

This modified version of the instrument was trialled at the same school as the first trial was made, and approximately two weeks later. The trialling showed the format of the coding sheet, the categories to be observed and the time sampling technique to be satisfactory. The instrument was considered to be developed sufficiently for inter-rater reliability to be tested.

Validity and Reliability

Content validity was derived essentially from the basis on which the instrument was developed; that is, the eclectic theoretical approach of teachers and teacher judgment. The behaviours for which records were produced were considered to be those behaviours which teachers of young children expect a socially competent child to exhibit. No measure of validity was obtained.

Inter-rater reliability estimates were obtained using Flanders' (1967) modification of Scott's (1955) method. Two observers, the author and a colleague who had considerable experience with children in the first

years of school, made observations according to the instructions on the Social Competence Scale.

The second observer received three training sessions. The first training session was held at the University. It involved discussion, questions and clarification and lasted about 30 minutes. The two subsequent training sessions took place in a kindergarten classroom in a nearby school. On each occasion, each observer recorded the behaviour of 22 children as they went about their normal, daily activities. Each training session was of about two hours' duration. Reliability estimates were made on data recorded on each of these occasions.

Observations made at the next session were used to obtain the actual reliability estimates. These observations were made in the same classroom, and on the same 22 children as had been used previously. The session lasted about two and a half hours. An inter-rater reliability, estimate of .825 was obtained. There was about a 10 percent increase in reliability with each session (i.e. the two training sessions and the final session). As training sessions were quite short, it is likely that a higher reliability estimate would have been obtained over more, or longer, training sessions. However, .825 was considered an acceptable level. The instrument was therefore considered to be sufficiently developed for pilot testing.

THE PILOT STUDY

The Sample and Procedure

Fifty-two children from three kindergarten classes in a school in a lower-middle class Sydney suburb were observed at school entry and again at the end of the year. There were 25 boys and 27 girls.

Observations were made by the Investigator according to the instructions of the final version of the Social Competence Scale (see Appendix A). That is, each child was observed for intervals of two minutes on six occasions, making a total observation period of 12 minutes.

On completion of the observations, the occurrences of each particular behaviour were summed, giving a total of 38 scores for each subject. All scores, including zeros, for each subject were punched onto cards for computer analysis.

Analysis and Discussion

With such a large number of scores for each subject, it is obvious that some sort of data reduction is called for. At first glance, factor analysis seems appealing. However, although other researchers have utilized factor analytic techniques with observational data (e.g. Jones, 1972), it is unwise to do so, since the usual assumption of normality may not be evident; behaviour measures rarely have normal distribution, zero scores being the most abundant (Jones, 1972:102). A more statistically sound method was thus sought.

Careful examination of the records for each subject at both observation periods revealed that zero scores appeared consistently across all subjects and at both observation periods, indicating that some behaviours did not occur at all. This was the case for several items "outside rules". These seven categories were eliminated from the analysis since

zero scores would not contribute to the analysis. The records were then examined for infrequently occurring behaviours. This showed that aggression occurred so infrequently that nothing would be lost if this was also excluded from analysis. This lead to the elimination of a further five items. It was considered that "Responds to orders (-)" (that is, when a child fails to respond to an order or instruction from the teacher), though relevant, may lead to confusing interpretation.

The items concerning play were also discarded, for two reasons: they did not occur as frequently as the other behaviours, and it was felt that the four verbal interaction items were conceptually more appropriate to the purposes for which the scale was being developed. Thus, 16 behaviours were left for further reduction.

It should be pointed out that the Social Competence Scale could be used in different settings. Determining which items are to be excluded from analysis would depend, largely, on the nature and purposes of the particular investigation and the theoretical assumptions on which it was based.

The remaining 16 items were computed as follows:

Obedience (1): this socre is the sum of occurrences of "responds to orders (+)".

Cooperation (5): as the five behaviours in this category are conceptually similar, all occurrences of these five behaviours were summed to obtain a single score for "cooperation".

Interaction-positive (4): all occurrences of the four verbal interactive skills, which occurred "within rules", were summed to obtain a single score for "interaction-positive".

Autonomy (2): the occurrences of the two behaviours, which are conceptually similar, were summed to obtain a single score for "autonomy".

Interaction-negative (4): all occurrences of the four interactive skills which were observed "outside rules", were summed to obtain a single score for "interaction-negative".

Thus, scores could be computed for each subject on each of the five competences: obedience, cooperation, interaction-positive, autonomy and interaction-negative. However, in this form, they are discrete categories, better suited to descriptive statistics, rather than inferential or correlational statistics which require continuous scores.

The discrete scores were converted to continuous dichotomies in the following manner:

The group means on each of the five competences were calculated. For each subject, scores $\geq$ mean were classified as high, while scores $<$ mean were classified as low. In all further analyses, high = 2 and low = 1.

Table 1 shows the allocation of the social competence scores to a high-low dichotomy.

TABLE 1

Allocation of Social Competence Scores to a High-Low Dichotomy

Social Competence	School Entry		End-of-Kindergarten	
	Low	High	Low	High
Obedience	<1	≥ 1	<2	≥ 2
Cooperation	<2	≥ 2	<2	≥ 2
Interaction^{+ve}	<2	≥ 2	<2	≥ 2
Autonomy	<1	≥ 1	<2	≥ 2
Interaction^{-ve}	<1	≥ 1	<1	≥ 1

To ensure that the newly formed dichotomous scores did, in fact, have discriminatory powers, and were thus a satisfactory means of translating discrete scores into continuous scores, a t-test on repeated measures was performed.

Table 2 shows the means, standard deviations and significance levels for the five social competences at school entry and the end of kindergarten. Results indicate that there was a statistically significant change in autonomy over the year. That is, children were observed to be working more on teacher-directed and self-directed tasks at the end of the year than they had been at the beginning of the year. Change is evident in the other four competences, that is, more obedience, less cooperation, and more interaction, but this change is not statisically significant. Hence, indications are that the method of data reduction, together with the dichotomous scores, can be used satisfactorily to produce reliable measures of social competence.

TABLE 2

Changes in Social Competences Between School Entry and End-of-Kindergarten

Social Competence	School Entry		End-of-Kindergarten		
	$\bar{X}$	s.d.	$\bar{X}$	s.d.	t
Obedience	1.46	.50	1.56	.50	N.S.
Cooperation	1.58	.50	1.52	.51	N.S.
Interaction^{+ve}	1.50	.50	1.58	.50	N.S.
Autonomy	1.12	.32	1.70	.47	-8.34*
Interaction^{-ve}	1.25	.44	1.40	.50	N.S.

* $p < .001$

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APPENDIX A

MACQUARIE UNIVERSITY

TEACHER EDUCATION PROGRAM

SOCIAL COMPETENCE SCALE

Name : _____

Activity : _____

		WITHIN RULES	OUTSIDE RULES
Obedience	+		
Responds to orders	-		
Co-operation			
Shares materials with peers			
Shares materials with adults			
Accepts/gives help - peers			
Accepts/gives help - adults			
Takes turns			
Interactive Skills			
Asks questions			
Answers questions			
Initiates conversation			
Participates in conversation			
Initiates play			
Participates in play			
Autonomy			
Works alone on teacher-directed task			
Works on self-directed task			
Aggression			
Initiates an aggressive act - verbal			
- physical			
Retaliates - verbal			
- physical			

THE SOCIAL COMPETENCE SCALE

A time sampling technique is used to record the behaviour of children observed. Arrington (1943:3) defines time sampling as

> ...a method of sampling the behaviour of an individual or group in which the occurrence of specific overt acts - or a classification of such acts according to predetermined definitions - is recorded in a series of time periods of uniform length in such a way as to yield quantitative measures descriptive of the characteristic frequency or variability of the behaviour for that individual or group under the conditions of behaviour.

For this scale, the unit of time for each observation is two minutes. A stop-watch is used for timing each observation. Observations are made throughout the entire school day - not only in free activity periods - since the scale is measuring "in school" behaviour. Six observations of each child are made (i.e. each child is observed for a total of 12 minutes). The observer should ensure that each child is observed in a variety of activities, e.g. listening to story, free activities, maths, singing, so that behaviour in all types of situations is sampled.

Categories

The scale includes six main categories; namely, obedience, co-operation, interaction-positive, autonomy, aggression and interaction-negative. Aggression is a negative behaviour, and the absence rather than the presence of this behaviour is considered desirable in a socially competent child. It is more likely to appear "outside the rules" rather than "within" the rules.

Each category can be observed either "within rules" or "outside rules". "Within rules" refers to those occasions when the behaviour exhibited is acceptable to the teacher. "Outside rules" refers to those behaviours which are not acceptable to the teacher at a particular time without her knowledge or in direct disobedience of a directive.

Although the coding sheet allows for all behaviours to be chedked in both "inside rules" and "outside rules", it has been found that occurrence of behaviours other than interactive skills and aggression "outside rules" is rare. However, it could be that they occur more frequently in classrooms where the teacher's management skills are not strong.

1. Obedience

This category includes all those times when S does, or does not do as the teacher asks, suggests, commands.

Responds to Orders

Positive (+) when the teacher says "Stop what you are doing and pack the blocks away", if the child does as directed, check in the "+" section of the "within rules" column. If the child ignores the directive and continues with the task, check the "-" section in the "within rules" column, if it is acceptable to the teacher to continue, and in the "outside rules" column if it is not acceptable.

2. Co-operation

The five sub-sections in this category are intended to measure S's ability to co-operate both with peers and adults.

Shares Materials with Peers

i. Group activities such as singing, T.V., poetry, story, games, e.g. (Simon Says) are considered "materials". If child is participating, check, but, if child is passive i.e. not singing when everyone else is, do not check.

ii. Activities using materials such as pencils, paints, blocks, puzzles, doll's corner, where children work in groups, if child shares willingly, check. If child snatches, fights, withholds materials, do not check this category, but consider checking "aggression".

Shares Material With Adults

As above. If child is attentively listening to story, check. If teacher works with child, showing how to do puzzle, asking about book, explaining task, check this category and also check "accepts/gives help - adults".

Accepts/Gives Help - Peers

i. Helps another child tie laces, put materials away, explains what is to be done.

ii. Has laces tied by another child, is shown how to complete puzzle, pack rods, do task.

Accepts/Gives Help - Adults

i. Cleans-up for teacher, does message, gets something for teacher.

ii. Teacher helps with work, gets tissue, shows how to use scissors, pin-up painting.

iii. Teacher explains task e.g. stencil, craft.

Taking Turns

Does not grab at snack time. Waits for lunches to be given out. Waits till someone else has finished with material e.g. paint, brushes, bikes, dressing-up clothes, stands in line while waiting for teacher to help, puts hand up and waits for teacher to come.

3. Interaction - Positive

This category is designed to measure those occasions when S interacts verbally and non-verbally with peers and adults.

Asks Questions

Check if child asks questions either of other children or teacher, e.g.:

How do I do this?

Where does this go?

Do you know what my mummy did?

Can I have a go?

Answers Questions

When teacher asks - either of the individual or of the whole group, e.g. "What did Henny Penny find?" - if child puts up hand, check, if calls out answer, check in "inside rules" column, if this is acceptable to teacher. Otherwise, check in "outside rules" column.

Initiates Conversation

If child begins to talk to other child/children/teacher to give information or gain attention in free or group activities, if it is at a time when talking is forbidden, e.g. story-time, T.V., Show and Tell, check "outside rules". It could also be in the form of a question, if so, check both categories.

Participates in Conversation

Answers questions, responds to something another child or adult has said.

Initiates Play

Check if child starts the game or activity. Behaviour could occur "outside rules" if it is in the form of tickling, poking, pulling during group activities such as story, singing. It could also occur with "initiates conversation", e.g. "Let's play with the rods" or "Come over here and do this". Also, solitary play.

Participates in Play

Examples of this could be sand, water, block play, the dressing-up corner, running round between tasks, playing tag.

4. Autonomy

Some teachers encourage children to work independently and to make decisions about their own learning. This category is designed to measure how much S can work alone on teacher - and/or self-directed tasks.

Works Alone on Teacher-directed Task

Check if child responds positive to such directives as:

"Put your shoes and socks on."

"Put everything away, now."

"Colour the stencil."

"Make a pattern with Cuisenaire rods."

"Write your name."

Works Alone on Self-directed Task

If the environment is structured in such a way that the child is free to choose which activity to work with, and to move from one activity to another freely, check if child chooses and works at for a sustained length of time, such activities such as clay, blocks, puzzles, story-book, or gets a puzzle or book when another task is completed.

5. Aggression

This category measures anti-social rather than socially competent behaviour. It is usually not acceptable behaviour, therefore would occur "outside rules", though some teachers might tolerate mild forms of aggression.

Initiates an Aggressive Expression

Verbal: This occurs when the child expresses anger, frustration, hostility, aggressively with words. "Get out, you!", "I'm gonna get you!"

Physical: This occurs when the aggression is expressed by action, punches, grabs, snatches, scribbles over someone else's work, pinches, knocks things over, kicks.

Retaliates

Verbal: This occurs when the child responds aggressively, by word, to a statement or action. "Stop knocking my tower down!", "I didn't do it, he did!"

Physical: This occurs when the child responds by an aggressive action (e.g. kicks, punches, pulls, twists arms) to a statement or action.

6. Interaction - Negative

This is the same as Interaction - Positive, but occurs "outside rules".